

A Summary of the Research on the Continuous Participation Willingness of the Contractors of Crowdsourcing Logistics

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Abstract

In the context of the Internet economy, crowdsourcing logistics has emerged. In order to achieve the optimal allocation of social resources and increase the participation rate of contractors from the crowdsourcing logistics platform, the existing literature on crowdsourcing logistics is systematically sorted out. Firstly, it introduces the development status of crowdsourcing logistics, and then summarizes the related research of crowdsourcing logistics from two aspects at home and abroad, and draws the conclusion that there are very few researches on the willingness to participate in crowdsourcing logistics at home and abroad. Finally, combined with the literature review of the previous theories about participation behavior in the field of crowdsourcing and crowdsourcing logistics, it is believed that the current research on the willingness to participate in crowdsourcing logistics lacks multi-agent perspective analysis such as platform and subdivision of contractors. I hope this article can Provide more perspectives and help for the future research on the participation mechanism of crowdsourcing logistics contractors.

Keywords

Crowdsourcing logistics, participation behavior, willingness to participate, influencing factors.

1. Introduction

In recent years, with the rapid development of science and technology, in the context of the "Internet +" era, thanks to the continuous optimization of mobile Internet, big data analysis, artificial intelligence and other technologies, new business models continue to emerge. Under such a background, business managers with innovative thinking put forward the idea of gathering the wisdom of the crowd and raising the power of the crowd, trying to outsource the internal tasks of the enterprise to the public [1]. This is the idea of "crowdsourcing" put forward by Jeff Howe (2006), a reporter from Wired magazine in the United States, that is, a company or organization outsources tasks originally performed by internal employees to non-specific A way to accomplish this through the public network [2]. Although the concept of "crowdsourcing" was not proposed recently, it has been applied and developed rapidly in recent years. Crowdsourcing has received great attention from some scholars because the support of information and communication technology allows users to use mobile devices at any time and anywhere to connect and interact with each other. It can be said that smart mobile devices have revealed the potential of crowdsourcing. Let the impossible become possible [3]. Crowdsourcing has formed a new innovative model that is different from the traditional model. The same is true for crowdsourcing logistics. The distribution tasks originally undertaken by couriers within the enterprise are distributed to the masses through crowdsourcing logistics. This model not only maximizes the use of human resources in the society, but also ensures logistics distribution. The socialization and fragmentation of power.

At the same time, the development of the Internet has also received strong support from relevant government departments and policies. At the National People's Congress meeting held in 2015, Premier Li Keqiang first proposed the concept of "Internet +", applying Internet technology to traditional industries to promote the transformation and development of traditional industries. In the thriving mobile Internet environment, new business models such as O2O have achieved a spurt of growth, and have continued to develop in a more specialized and in-depth direction. The new O2O business model is combined with the diverse needs of consumers, and the traditional "consumption in store" model has been extended to "consumption at home", resulting in a large amount of immediate delivery demand.

The current instant delivery market mainly relies on three methods: crowdsourced delivery, self-operated delivery and agency delivery. Among them, crowdsourcing distribution has attracted widespread attention with its socialized solutions and lower costs. How to attract more people to participate in crowdsourcing distribution is the basis for this business model to expand in the future. Therefore, based on this background and on the basis of the new business model of crowdsourcing distribution, we will study what factors affect the public's willingness to participate in sustainable development, and explore the decisive force that can increase the number of participants in crowdsourcing distribution and expand the market scale.

For the participants of crowdsourcing logistics, due to the low barriers to entry, too many people have increased the competitive situation and discouraged some participants. From the perspective of enterprises and platforms, the qualifications of the participants of crowdsourcing logistics distribution are uneven, and the service quality of the distribution process cannot be guaranteed. And because the participants are scattered and not fixed, it is difficult to conduct personnel management and training, causing irregular behaviors, and the risks of crowdsourcing logistics distribution are self-evident. As an organization manager of crowdsourcing logistics and distribution, how to improve service quality, reduce risks, and make the model run smoothly and normally has become a problem that has to be faced. Therefore, it is necessary to understand the psychology of different types of public participants, analyze the influencing factors that affect their willingness to participate and service behavior, use scientific methods to formulate different incentive mechanisms and punishment mechanisms, improve the system, and strengthen supervision.◦

2. Crowdsourced Logistics Related Research

2.1. Research Status Abroad

In terms of academic research, although foreign scholars have conducted in-depth research on crowdsourcing, their research on the emerging topic of crowdsourcing logistics is relatively insufficient. The research of foreign scholars in this field mainly focuses on the design and construction of crowdsourcing logistics system, taking crowdsourcing logistics as a solution to problems, and evaluating crowdsourcing logistics models.

Horton (2010) believes that the popularity of mobile smart devices makes online task matching more convenient, and users can find nearby people who can perform tasks through geographic positioning [4]. This reduces the instability of the partnership caused by the lack of detailed information on the crowdsourcing information platform, and provides the possibility for crowdsourcing to provide other project services.

Doan (2011) proposed that the Internet can assist the crowdsourcing system to recruit a large number of non-specific groups, use the wisdom of the crowd to solve various problems, and can establish a database or network at an amazing speed [5]. The crowdsourcing system can also realize the logistics function of using the public's idle resources to deliver goods or information at the correct time and place, which helps to quickly expand the logistics network and improve the efficiency of logistics distribution.

Chanal V (2008) pointed out that crowdsourcing can help companies use external knowledge and resources to support their internal production and R&D. It is an innovative idea from closed to open [6]. The crowdsourcing logistics distribution model can also gather a large number of idle social resources and solve the problem of insufficient internal capacity of the enterprise.

Pan (2015) uses crowdsourcing thinking to propose a solution for e-commerce reverse logistics, that is, using taxis in the city to complete the process of returning products from consumers to retailers, which can reduce economic waste and environmental pollution; in addition, the author proposes two A collection strategy and its simulation evaluation [7].

Ranard (2014) studied the promotion of crowdsourcing in the fields of health and medicine, and also described the process involving crowdsourcing logistics. That is, some companies (crowdsourcers) use the Internet to outsource the logistics and distribution process to individuals (crowdsourcing) Participant) [8].

Afuah (2012) mentioned two modes of operation of crowdsourcing logistics in his research: First, based on the crowdsourcing of competition, the crowdsourcing party chooses only one participant to provide a solution, for example, only the winner of the competition can accept the package. The logistics distribution task from point A to point B; second, based on collaborative crowdsourcing, crowdsourcing participants jointly solve a problem, for example, many crowdsourcing participants will share traffic information in real time [9].

Mladenow (2015) summarized the concept and application of crowdsourcing logistics, discussed the potential advantages and challenges of crowdsourcing logistics, introduced the research process and analysis results of location-based crowdsourcing (LBCS), and proposed technical enhancement tasks Suggestions for combined matching algorithms [10].

Pradana (2015) designed a logistics management information system. Indonesia can use the concept of crowdsourcing and virtual communities to create a national information disclosure system. The public can provide logistics information and complement the accuracy and completeness of the information through mutual exchanges and cooperation. Active participation can assist Indonesia's logistics information system [11].

Paloheimo (2015) used Finnish library public services as a case study to investigate whether non-consumers can accept crowdsourced delivery, and whether consumer participation in crowdsourced delivery has sustainable benefits; the research found that it can be achieved, and every crowdsourcing Delivery can reduce the average driving distance by 1.6 kilometers [12].

The concept of crowdsourcing in Klumpp (2017) has been gradually developed under the background of social media, Industry 4.0 and dynamic logistics processes and concepts. Global supply chains need to increase sustainability, flexibility and safety. Logistics solutions based on crowdsourcing The lack of practical support still has potential [13].

2.2. Research State in China

The current research on crowdsourcing logistics distribution in our country mainly focuses on the exploration of crowdsourcing logistics innovation model, current situation analysis, and existing problems.

Huang Zhengwei et al. (2015) believe that due to its own advantages, the crowdsourcing express service model can easily solve the problems of large express business volume, violent sorting caused express delivery damage and "last mile" unsmooth delivery. The author also systematically analyzes the necessity and feasibility of developing crowdsourced express delivery services, and believes that to actively respond to and solve existing problems, the crowdsourced express delivery service model must be the future development trend [14].

Ji Hanlin et al. (2016) took the fresh food e-commerce industry as the research object and believed that its development status is unstable, and there are problems such as low cold chain logistics management, difficult product quality assurance, high distribution costs, and high

product prices. The author proposes the application of crowdsourcing distribution model in the field of fresh food e-commerce, namely crowdsourcing logistics and crowdsourcing warehousing. He believes that with the construction of information-based crowdsourcing warehousing management system and the establishment of an integrity system, the crowdsourcing model will definitely be able to solve the problem. The existing problems in fresh e-commerce have created a new model of logistics and warehousing [15].

Chen Yaoting et al. (2017) focused on the "last mile" distribution problem of fresh food, and summarized the four distribution models of fresh food e-commerce companies, namely, delivery to the household, direct-operated convenience store model, community franchise store model, and express delivery box model. In response to a series of problems such as the scarcity of cold chain equipment resources in the fresh food distribution in my country, which affects product quality, the loss of fresh products in the distribution link, the weak traceability of information and the low degree of sharing, etc., practical and effective development suggestions are put forward [16].

Yin Juanmei's (2016) research paid attention to the development of my country's crowdsourcing logistics economy, and compared the business model, profit model and flow of Renren Express and DOORDASH, and pointed out that crowdsourcing logistics represented by these two models are facing The predicament of using big data, supplemented by the transformation of the credit information system [17].

Qiang Li (2017) compared the pros and cons of the crowdsourcing express delivery model with the traditional express delivery model, and proposed that by building an urban logistics information sharing platform, a city delivery model system of "traditional express delivery + crowdsourcing express delivery" can be built to achieve value sharing among enterprises. Chuanglai meets the growing demand in the distribution market [18].

Wei Lipeng et al. (2017) believe that although the crowdsourcing logistics distribution model can effectively reduce the distribution costs of fresh food e-commerce, there are certain risks in the operation process. The author cuts into the four aspects of market risk, employment risk, cold chain logistics risk, and platform risk, and builds a comprehensive and scientific evaluation index system, which can not only check the defects and deficiencies in the operation of fresh food e-commerce, but also evade e-commerce platforms Risk provides reference [19].

Some scholars are concerned about issues such as the quality management of crowdsourcing logistics services and the optimization of distribution networks.

Lin Wanting (2016) aimed at improving the quality of crowdsourcing logistics services in response to the chaos of domestic crowdsourcing logistics services, selecting five dimensions including reliability, responsiveness, assurance, empathy and safety, referring to the system dynamics model Constructed a crowdsourcing logistics service quality evaluation system; and conducted simulation to verify the scientificity and operability of the model [20].

Zhao Xinglong (2016) pays attention to the network optimization problem of crowdsourcing distribution, uses the K-means clustering algorithm to determine the crowdsourcing network, and uses the largest single income of the crowdsourcing distribution participants as the objective function to establish a crowdsourcing distribution path with a time window. The optimization model and the dynamic optimization model of the crowdsourcing distribution route solve the problems of delayed distribution and unmanned order taking in reality. Finally, the effect of the optimized crowdsourcing distribution network is verified through examples [21].

Regrettably, there are only a handful of authoritative journal literatures on crowdsourcing logistics, and the subject of research is only influencing factor analysis and pricing model and strategy design.

Liang Xiaobei (2017) and others applied empirical analysis to study the relationship between participation motivation, subjective norms, perceived behavior control, satisfaction and the willingness to continue participation of crowdsourcing logistics contractors [22].

Binhou et al. (2019) studied the relationship between logistics operation mode, industry environment, external incentives, internal benefits, conversion safety and conversion cost and the implementation of crowdsourced logistics by enterprises based on the perspective of the contracting party [23].

Wang Wenjie et al. (2018) studied the dynamic pricing model and strategy of crowdsourcing logistics services based on the perspective of service provider competition under random demand [24].

From the existing research on crowdsourcing logistics, it is not difficult to find that foreign scholars mostly regard the crowdsourcing logistics model as the solution to the problem. In China, due to the rapid development of crowdsourcing logistics in recent years, and the lack of existing theoretical foundations, scholars have mostly focused on the analysis of its development status, pros and cons, risk analysis, etc., and cannot effectively solve the related problems. The management of participants by enterprises and information platforms.

3. Research on Crowdsourcing Participation Behavior

Public participation is the key to the success of crowdsourcing innovation. For a crowdsourcing website or event to be successful or high-performance, it must be able to attract enough users to participate spontaneously. Exploring and discovering the key influencing factors of the willingness of contractors to participate is of great significance to the sustainable development of the crowdsourcing model. Including but not limited to the following types of research:

(1) Research on the motivation of contractors based on motivation theory.

Liang et al. (2018) [25] empirically verified the influence model of different dimensional motivations on the willingness of contractors to participate. Both intrinsic motivation and extrinsic motivation have a positive impact on the willingness of contractors to work, and external motivation has a clear crowding-out effect on internal motivation [25].

(2) Based on task design theory and reputation theory, the research on the influence of the relevant factors of the contractor, focusing on verifying the influence of task setting and the reputation of the contractor on the behavior of crowdsourcing participation.

Zheng et al. (2014) [26] focused on the impact of task bounty and the interaction between the sender and the receiver on the participation behavior of the contractor. Xu Xiangyi and Wang Guiyun (2016) [27] verified the influence of the credit of the contractor on the participation behavior of the contractor in their research. The higher the reward, the longer the deadline, and the lower the difficulty of the task designed by the contractor, the more able to attract contractors to register and participate and submit the plan [26]; enterprise contractors with better reputation are more likely to attract more numbers and Higher level contractors [27].

(3) Research on the influence factor model of contractors' willingness to participate based on motivation theory and Luin's behavior model, research on the moderating effect of centralized platform factors on crowdsourcing participation willingness through participation motivation.

Sun Qian et al. (2016) [28] studied the antecedent model of the influence of platform factors on participation willingness of contractors with participation motivation as the mediating variable. The rights and interests of the platform and the innovation environment will affect the motivation of contractors to participate in crowdsourcing activities [28], and then affect the willingness of contractors to participate.

(4) Research on willingness to participate in contractors based on UTAUT model.

Tao Meng et al. (2014) [29], Tu Yan et al. (2015) [30] verified the influence of the expected income of the contractor from participating in crowdsourcing activities and platform cooperation on the behavior of crowdsourcing participation based on the UTAUT model. Performance expectations, effort expectations, community influence, and the trustees' trust in the senders and the crowdsourcing platform will actively drive the contractors to have a high level of willingness to participate in crowdsourcing. However, the cooperation of the platform will not affect crowdsourcing participation. Willingness has an impact [29, 30].

(5) Research on the influencing factors of contractors' willingness to participate based on social exchange theory.

Li Longyi and Wang Qiong (2014)[31], Ye and Kankanhalli (2017)[32] analyzed the impact of the benefits and costs of participating in crowdsourcing activities on the willingness to participate in crowdsourcing in their research. The more money gains, skill improvement and fun gained from participating in crowdsourcing activities, the stronger the willingness of the recipients to participate in crowdsourcing; the higher the cognitive cost and execution cost paid, the weaker the willingness to participate.

To sum up, it can be seen that the research on the factors affecting the willingness to participate in crowdsourcing is mostly based on different theories, starting from different interactive subjects, and some focus on the factors involved in the single subject of the contractor, the contractor or the platform. Focus on the internal connections between the factors involved in different subjects

4. Research on the Participation Behavior of Crowdsourcing Logistics

Lu Xinyuan (2018), etc., based on the PAM-ISC and TPB models, constructed a model of the influencing factors of the public's continued participation in crowdsourcing logistics activities, and put forward suggestions for the crowdsourcing logistics platform to improve the performance expectations of the public in participating in crowdsourcing in multiple ways[33].

Guo Jie (2017), based on the integrated theory of technology acceptance and use (UTAUT), proposed a research model on the influence factors of crowdsourcing logistics mass participation behavior, collected data in the form of questionnaires, and used the structural equation model (SEM) method Analyze the collected valid samples [34].

From the perspective of platform function support, Wu Wenbing (2019) and others studied the factors that influence drivers' willingness to continue to use the shared logistics platform. Based on the technology acceptance model, the "perceived safety" variable was introduced to build a driver's understanding of the shared logistics platform. Continuous use willingness model [35].

Qiu Hongquan (2018) Based on the perspective of behavioral decision-making, used the technology acceptance model to build a theoretical framework model of the factors affecting the behavior of crowdsourcing logistics. Through empirical testing, it was found that individual perception factors and system factors have a positive impact on the willingness to participate in crowdsourcing logistics. , The willingness of public participation also has a positive impact on public participation in crowdsourcing logistics [36].

Bin Hou (2020), etc., based on the theory of organizational embedding and commitment-trust, built a model of factors affecting the willingness of crowdsourcing logistics contractors to continue participating, and studied the internal embedding of the organization, the external embedding of the organization, trust and the willingness of the contractor to continue The relationship between [37].

In summary, domestic scholars' exploration of factors affecting crowdsourcing participation willingness or behavior mainly includes: research on participation motivation from the perspective of the subcontractor's subject[22,33], based on UTAUT model[34] and TAM

model[35,36] The willingness of contractors to participate, commitment-trust theory [37]. The research on participation behavior of domestic crowdsourcing logistics mostly focuses on the factors involved in a single subject of the contractor or platform, and hardly focuses on the internal connection between the factors involved in different subjects, and various influencing factors drive crowdsourcing logistics participation The dominance of willingness lacks in-depth analysis. In addition, the existing research on the factors affecting crowdsourcing logistics participation willingness is based on the assumption of homogeneity, leading to the existence of different research conclusions on the relationship between influencing factors and crowdsourcing logistics participation willingness Inconsistency [33,34]. Zheng et al. (2011)[38] carried out a cluster analysis based on motivation for the group of contractors in their research. The study found that there are big differences in the motivation of participation among different subdivision groups of contractors, and called on scholars to focus on Different sub-groups carry out more detailed research on the driving mechanism of participation willingness. Although existing researches involve differences in the motivations of different subdivision groups of contractors, few studies have explored whether there are differences in the driving effects of different subdivision groups, different dimensional motivations and other influencing factors on participation willingness , The research on the drive mechanism of the willingness to participate in the contractors needs to be further deepened.

Based on this, this article believes that the possible conditions of the relationship between influencing factors and willingness to participate in the crowdsourcing model depend on the heterogeneity of the participants. When the internal cognitive system is working, there may be differences between participants in the judgment of the driving effect of influencing factors.

5. Currently Existing Problems

With the continuous development of the crowdsourcing logistics market, more and more diverse groups of mass contractors have participated in it. However, it is precisely because of the diversity of mass contractors that the difficulty of crowdsourcing activities management has been increased.

At this stage, the crowdsourcing logistics platform has not formed a deep understanding of the differences between the public contractor groups, and has not formed an efficient task recommendation mechanism; the platform also does not know which group of people should be focused and highlight when publishing tasks Which task elements lack a targeted and efficient crowdsourcing incentive strategy. Therefore, on the basis of clarifying the influencing factors of the willingness to participate in crowdsourcing logistics, identifying the cognitive differences among the mass contractors in the influence of different factors, and then incentivizing participation behavior in a targeted manner, is to prosper the crowdsourcing innovation market and promote logistics Key factors for the in-depth development of the crowdsourcing model.

6. Further Work

This article hopes to summarize the influence factors model of crowdsourcing logistics public participation willingness, combined with the enlightenment of heterogeneity theory, and explore the influence of unobservable heterogeneity on the influence factors and crowdsourcing participation willingness by constructing a structural equation model with moderating variables. The moderating effect of the relationship, based on the potential group mining method to identify the subdivision groups of the public, and explore the leading factors that may affect the willingness of different public to participate.

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